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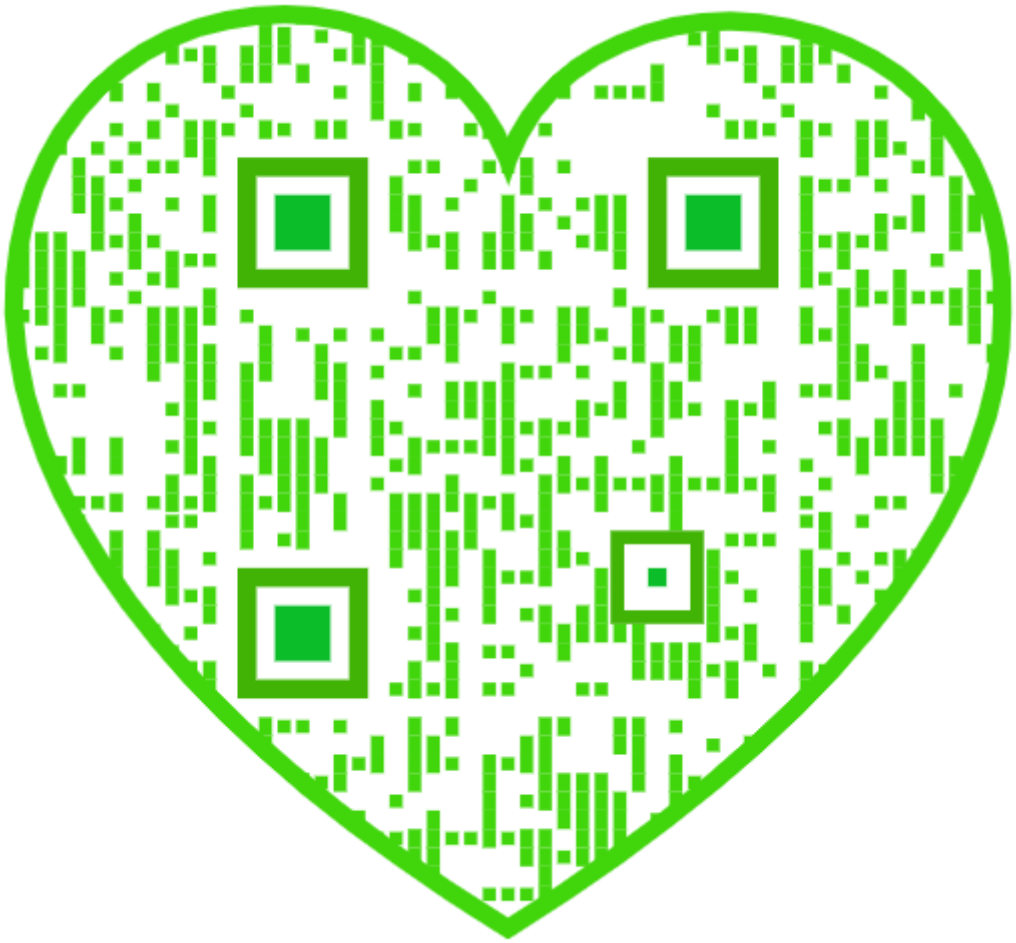

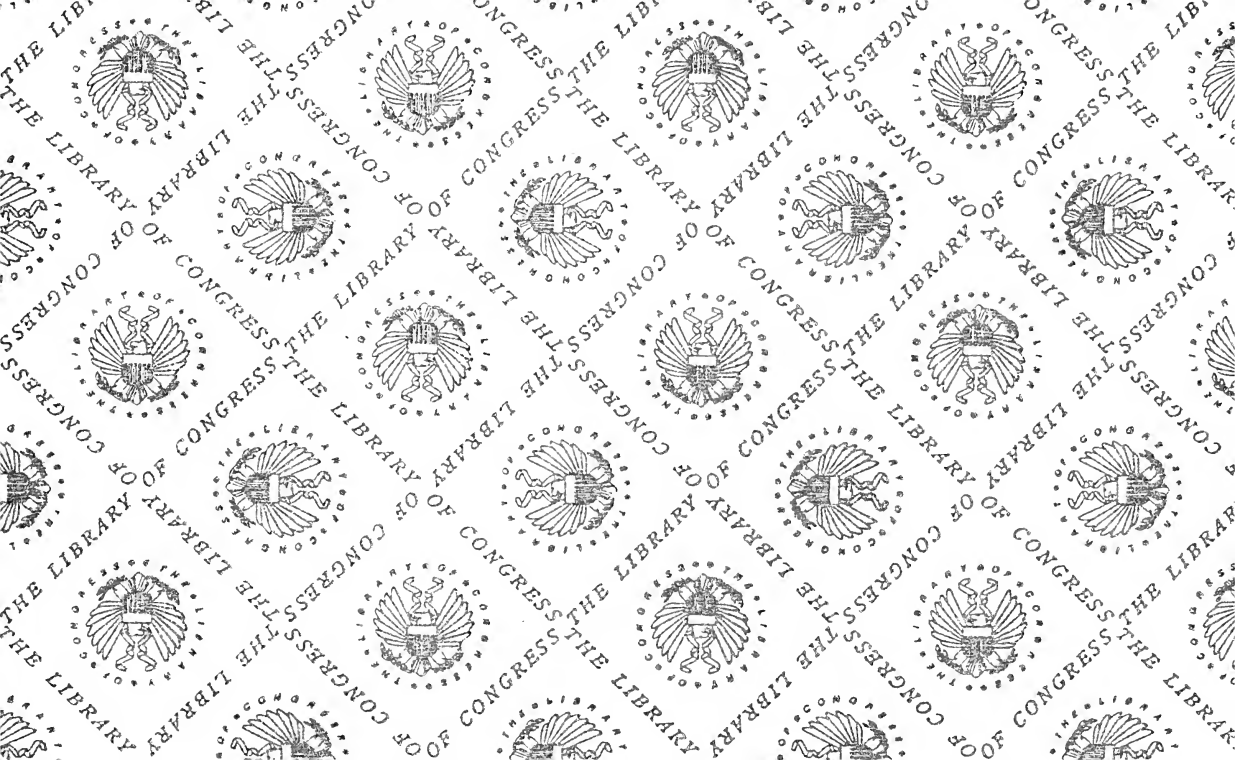
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ALBERT AINLEY

Weave Room Management

A BOOK of Instruction Information and Advice for the Coming Generation of Overseers of Weaving and for all who are Interested in the Subject

ALBERT AINLEY

1910

MAPLEVILLE, RHODE ISLAND

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PREFACE

Knowledge gained by the experience of others and put into practice by one's own exertions develops the brain.

A man cannot gain sufficient knowledge by his own experience alone; he must gain some of it from other sources if he intends to keep in the procession near enough to hear the band play.

The coming generation of overseers will need all the technical education available in their line of work in order to climb the ladder of success. Some of the present generation are sadly in need of it. Did you, as an intelligent weaver or loom-fixer, ever have to work for an overseer who was deficient in intellect, thick headed, of poor judgment and afraid to take a step outside of the beaten track, no matter how much laborious work he might save by cutting across; did you? Then you will appreciate the efforts herein made towards his education or eradication.

But it was another and a brighter thought which inspired the writing of this book. It was a realization of the fact that those best adapted to hold a responsible position are most anxious to gain all the knowledge and information they can; the better to enable them to fill it not only to the

best advantage to themselves, but to the satisfaction of those for whom and to whom they are responsible.

That those best adapted to fill such positions may find the necessary knowledge and advice available was the inspiration of

THE AUTHOR.

THE MANAGEMENT OF A WEAVE ROOM

The work of a boss weaver is purely and simply the management of the weave room in such a way that the material which comes into it will be made into cloth of the desired pattern and specifications with not more than a reasonable amount of defects; and enough of it to compare favorably with the amount of machinery and general expense involved; his efficiency is rated according to the comparison of these points.

The qualifications of a boss weaver are altogether different from those of a loomfixer, for, while the loomfixer's most necessary qualifications are patience, perseverance and a good knowledge of loomology, the overseer to be thoroughly efficient must, in addition to these things just mentioned, be a good organizer of forces, a good manager of help, have a great amount of tact, have the ability to keep up the efficiency of every branch of his department as well as to build it up in the first place; to know a good deal of human nature, be conversant with every detail of his department, but, above all, be a man of good judgment. It is not enough to be able to hand in, drawing, build chains, carry filling, run a winder,

be a good weaver, a good loomfixer, and a percher; if your judgment is poor your organization will be poor, its efficiency will be poor, your production will be poor both in quality and amount. I regret to have to say, however, that there are far too many people holding such positions who are hardly able to fill them to even good advantage; they reflect unfavorably on the judgment of the superintendent and often result in strikes, hardships and failure.

A knowledge of designing, cloth construction, etc., is hardly necessary further than to know that, in cases of combination weaves, some threads of which have more work to do than others, the position of certain harnesses may be changed; that is to say that, supposing the threads on the last harness or last two harnesses, etc., go worse than the others, the drafts can be so changed over as to put this particular weave on the front or the middle or some other place with the idea of humoring them somewhat. This, of course, the designer will do at the suggestion of the overseer of weaving. Thus, whatever designing it is necessary to know, is usually picked up as you go along or as you have gone along through the various parts of the business.

The duties of a boss weaver are to hire such help as are competent to do the work required of them; such as drawing in, handing in, bobbin

winding, chain building, warp starting, weaving loomfixing, perching, filling, carrying etc., or to educate such as he has to do these things. He is responsible for their work. If they do it well he gets the credit; if they fail, he gets the blame. His efficiency, therefore, lies partly in having the tact to make everyone do his work well. This, of course, in a country where there is such a conglomeration of people as there are here is no child's play, but involves a great amount of tact, ingenuity and good judgment. However, with a good system this is usually fairly well accomplished.

The production of a weave room depends in a great measure on the organization or system adopted for taking care of it, independent of the purely weaving end of it; and not only this, but the overseer's peace of mind depends on it as well. To be successful he must have a good system; the better the system and organization the better will be the production; the more smoothly it will run and the easier will be his lot. If such a thing as a perfect organization were possible everything would go along like clock work, and there would be no trouble at all, but as no one yet has been found with brains enough to accomplish this, we all have trouble more or less; they occur in proportion to the defects of the organization and system. Of course, much of the weave room

troubles are made in a preceding department and cannot be altogether prevented, but a good organization will handle them as they come along with little trouble to the overseer beyond bringing them to his notice in order that he may take steps towards preventing them in future.

Defects of the work as it comes into the weave room will bother the overseer in proportion to the imperfection of his organization. Some overseers are worked to death; others do very little manual labor. Do you see the point?

Now what I have found to be a good system is to appoint a man for every regular work and hold him responsible for that work; and when I hire a man for a particular work, select some one whose temperament and physical conditions make him suitable for that work. Thus, for instance, I want some one to look after the drawing-in part of the work; I select a man capable of lifting the warps onto the beam truck, one not afraid to dirty his hands or his clothes by cleaning harnesses, because for a medium-sized mill, say 60 or 70 looms on fine work, one man can do this work comfortably if he knows that what spare time he has can be used for his own amusement. Such a man can look after the drawers-in just as well as a man with a white starched shirt can. I hire the man to clean harnesses, put up the warps, etc., and he looks on a steady $10 or so a week as

fairly satisfactory. But if you hire a man as boss of the drawing-in department he would feel too big at the start; he would want a helper to do the harness cleaning, and $10 a week would look far too small.

By taking a man of average intelligence, used to hard work, you can, by good judgment in handling, soon bring him up to feel a full responsibility in his department, so much so that if at any time he is short handed and behind hand with the warps he will use his best endeavors to get whatever drawers-in or handers-in he needs to keep up with the work. In order to bring him up to this pitch, however, you must make it a practice to send applicants for positions to him, taking care, of course, to keep yourself posted to some extent. Thus this branch of your work will, after becoming well organized and systemized, give you little or no concern, though the price of your success as manager of the weaving department in general is eternal vigilance. There will probably be times when you need more drawers-in in a hurry; more than you can well get hold of, and it will be a problem how to get your warps drawn in on time. No matter how good your man is, there will be times when he will need your assistance. At such times as these, however, it is generally advisable to take the best of your handers-in and let them draw a few warps in. As a general rule there are always

enough boys and girls running around the street who are old enough to work, and it only takes about two hours to teach them how to hand in. Usually the drawers-in will find some one to hand in for them, some relation or neighbor with whom they will have patience enough to bother with while learning.

In harness cleaning, wherever there is a suspicion of the heddles being pretty well worn out, they should be carefully inspected and the bad ones broken off; thus frequent heddle smashes will be avoided.

THE LOOMFIXERS

These are necessarily the most intelligent of your help, and as a general rule are conscientious and thoughtful. Their work in general is well known and varies only in minor details. A section of looms varies in number according to system and kind of looms and work they are running, but usually about 20 Knowles looms make a section. In some mills they have fewer looms to a section, but the fixer looks the harnesses over at the start of the warps. He is also responsible for the ring separators being put on the chain in the right place at the start of the warp, when the chain stuff is old and worn. In other mills the chain builder is held responsible for this. You, the overseer, will sometimes find that you have to answer for a cut full of harness skips because the loomfixer, or whoever you held responsible, did not ring the chain up properly, and right here let me say that, as a general rule, especially where boys are used to build chains, I am satisfied that it is the best system to hold the loomfixer responsible for the ringing up of the chain. But whoever you hold responsible for this work, be very strenuous in bringing them up to do it well, or you will soon have a reputation for

turning off defective work. Be particular about the adjustments of the take-up and letting of motions at the start of every warp, and make it a rule not to allow the friction bands to be set in the heavy-weight notch of the lever if you can get weight enough on in the light-weight notch. Also be particular about having the temples set right and the heddles divided up right so that there will be no streaky goods on that account.

Do not allow them to let their sections get run down in any shape or form; if you find any one of them doing this, do not hesitate to find fault with whatever you see is wrong. Show him how it should be, courteously, of course, and keep up this policy with him until you get him well on to the upward tendency again.

THE WARPSTARTER

The same policy must be followed with the warp starter as with the loomfixer; as carelessness or the least slackening up at this point will surely result in mistakes getting by him.

As you are aware, he weaves an inch or two with a contrasting color of filling to that of the warp at the start, in order to better enable him to detect any wrong draw that may have been made. He should look this over carefully on the loom, and again more carefully when the lap is woven and the heading cut off. A wrong draw will not get by a good warp starter once in a thousand times. If, however, his mind is not altogether on his work when looking the heading over, they will get by him, and often a cut has to go as a second on that account. The overseer cannot afford to let such things slide by without taking steps to prevent a reoccurrence; he has got to say or do something that the man will not forget. If it occurs a second time without much intermission, you had better show him that you have lost confidence in him by looking them over yourself after he gets through with them (the headings), and keep this up until you get confidence in him again. If your plant is big enough

to have a second hand, he (the second hand) should do this work, especially on difficult patterns. Have the warp starter cut a small square out of the heading at the start of every warp and match it up with the original sample, and leave both it and the sample on your desk for you to match it up yourself as to color, weave, draw, etc. Thus wrong filling or anything else will and should be detected. The rest of his work will depend on your judgment in accordance with the size of the plant. If you haven't got a second hand, use the warp starter as such, and expect him to go around the looms with his eyes open and see things which may be wrong, whatever they are. Draw his attention to anything you find wrong that he ought to have seen, and let him know that you expect him to be right on to his job. Bring him up right at the start and all the time. Be aggressive when you find a man negligent, particularly so if he has a responsible position, but be liberal if he does his work conscientiously and well.

Whenever there is anything wrong with a warp and some alterations have to be made in the loom, it is well to instruct your warp starter to handle it, so as to bring him up right in taking care of such things. It may be easier for you to do it yourself, but poor policy. It is better to educate your help to handle most everything that comes

along. Make it a point to do this and you will not often find yourself crowded with work.

Make it a practice to promote your help to higher positions when competence and opportunity make such a thing practical. Thus the young man you have had building chains for perhaps years may be promoted to warp starter; in which case it would be good policy to hold him responsible for the work of his successor at chain-building. Make it a point to insist that there be no waiting for chains or for anything else as far as your department is responsible. Make it known in unmistakable terms that they will have to be right on to their job if they are going to hold it; but when you have a man who is unquestionably competent and faithful, do not be over ready to dock him his full pay for an occasional hour or two absence.

At the start of every warp there are an unlimited number of ways in which it may be wrong and not be noticed until the goods are finished, or, at any rate, until after they are woven. It depends to a great extent on the peculiarities of your help as to what you will need to lookout for the most, though as a general rule in this case as well as in other ways it is usually the unexpected that happens. One of your loom-fixers may be an almighty good man in every

way but one; that one, if it be a tendency to forget to ring up his harness chains at the start of the warp, may be the means of causing a frequency of harness skips. Sometimes a whole warp will be woven out with enough harness skips in each cut to make it a "second," and not one of them be seen until the cloth is finished. Another tendency may be a faulty adjustment of the take-up motion where the rachet gear is used. If not adjusted right you are liable to have it take up two teeth in place of one at certain places on the gear. That is to say, it may be set too near the edge of the tooth so that sometimes when the teeth are not all exactly the same size, the pawl will get over the edge and thus cause the pusher to take up two teeth in place of one at this point. This is a chronic failing with some people. It may be as well to state here that as a general rule the worm take-up is much more reliable and safer of producing evenly woven cloth than the rachet gear take-up is. The warp starter should be instructed and brought up to see that the rachet take-up gear has a safe clearance both at the pushing and holding catch.

Whenever defects occur through the evident neglect of any one in your department, try to make it as unpleasant for them as it is for you; study to say something about it that they will not forget. Everyone who has anything to do with

the starting of a warp is liable to make a mistake, in which case, of course, the goods cannot be used to fill the orders on which they were made. The work of the weave room, however, is usually so systemized that an error made at any stage of the work is usually detected and remedied in the succeeding stages. There may be some wrong colors in the warp or some of the right colors may be in the wrong place or get drawn in on the wrong harnesses, or there may be a mistake in the chains or in the drafts they are made from, or the wrong draft may have been used, or the filling carrier may make a mistake in the filling, or the warp starter may get the right colors in the wrong box, or in the wrong shed of the warp, or the loomfixer may have forgotten to change the take-up gear, etc., etc. In your system you may have a check or safeguard against every known liability, but, like burglar alarms and filling stopmotions, they are not infallible. A good warp starter would detect nearly all the above-mentioned mistakes ninety-nine times out of a hundred, but in order to make sure that the cloth you are about to weave is what is wanted, what is ordered and that there is no mistake about it, your warp starter should take the precaution to cut out a square about five inches wide and three or four inches long and lay it on your desk along with a clipping of the original sample. These you (the overseer) should com-

pare very carefully yourself, noting the colors, weave, yarn, general matching appearance, etc. But even then, considering that you are matching an unfinished piece of goods with a finished sample, you are liable to fail to detect an error, particularly so if it is a fancy piece dye. For instance, a certain style, say 6601-2, may have in its combination a 2 down and 1 up weave, while style 6601-3 may, while having the same general construction, have in place of a small stripe of 2 down and 1 up a mixed up affair of 3 down and 1 up. The chain builder gets — 3 instead of line 2 by mistake. The warp starter compares the draft with the chain, but fails to notice that the draft was 6601-3, whereas the ticket called for 6601-2; thus it got by him. All this, of course, is a supposition showing what might happen. Next, you get the sample to match up, but as you are matching up a rough unfinished uncolored piece of goods with a smooth-pressed colored sample, you fail to notice the slight difference in this part of the weave, and the whole warp is woven wrong. What are you going to do about it? You must amend your system so as to be sure of catching such a mistake in the future. To do this instruct your warp starter, when he brings the matching up samples and lays them on your desk, to bring the warp ticket and chain draft at the same time, so that when you match up the sample you can also compare the

draft number with the style number on the ticket and thus eliminate the possibility of such a mistake in the future. Let this be the rule and guide of your conduct in all cases where the peculiar weakness of your force makes a certain mistake or defect possible; devise a means of blocking such a possibility and incorporate such into your system. Some people cannot be depended on to do a thing right if there is a possible way of doing it wrong.

THE WEAVERS

Handling the weavers to the best advantage is where good judgment, tact and generalship are most needed. Although weavers as a general rule are conscientious and endeavor to do right as far as they know it, it is a well-known fact that they have their troubles and suffer much through the faults of others; more so perhaps than any other class of woolen mill help. It is therefore remarkable that good nature is as well kept up with them as it is. I well remember one good-hearted boss weaver who had great tact in handling weavers and others with a grievance of their own; he was no bully, but got along better than any thick-headed bully ever could. When a weaver or loomfixer would go to him with a tale of woe and a face as long as a fiddle, the first thing he would do after hearing their story would be to tell them a comical story, which as a general rule fitted their case; this and a little fatherly talk usually cleared the mental atmosphere, and nine times out of ten sent the discouraged one away with his spirit fourteen shades of a lighter blue. He, however, had his faults, if such they may be called, for it was well known that the best weavers got the most difficult work marked out

for them whenever there was any choice to be made; which, of course, may not be a fault at all from a one-sided standpoint, but from an impartial standpoint not every one could have done it to their own advantage as much as he did. However, to proceed with the subject matter, it is well known that there are always some weavers who are incompetent, careless, thoughtless, mean and ignorant. Some one thing, some another and some the whole business combined. It is with these that your concentrated skill of management is most needed. Of course, the first impulse which comes to mind is "fire them;" if they are no good or do not govern themselves in a proper spirit, "fire them." But this, to a good, conscientious, thoughtful overseer, does not always seem the right thing to do, especially so in a one-horse town where if you discharge one man the whole family must either move or disintegrate to some extent, causing great hardship either way. A good overseer often puts up with a man for these reasons, although it does not seem to be to his best interest to do so. If a weaver is incompetent, but still tries hard to hold his job, it is the overseer's Christian duty, his human duty and and his brotherly duty to try to educate him after having once hired him, and to use his best endeavors to make him competent.

His work should be taken away from him only

as a last resort, when without a doubt you are satisfied that weaving good cloth is not one of his attainments. If, however, an incompetent weaver does not make any great effort to take off good work, it is of course a different matter; it would then be foolish of an overseer to lower his own standing and take chances of injuring his reputation by keeping him any longer than he can help.

Various devices are in use for keeping the weavers' work up to a high standard of quality, such as graded price lists, fines, etc.; but as these are well known to every one with wide enough experience to attempt the management of a weave room, it is hardly advisable here to take up time and space discussing them further than to say that much more severity should be used in fining weavers whose work is usually below the average than with those whose work is usually above the average. Even if you have a "fine" list to work by, you have to use judgment in imposing fines.

If you have a percher who is trustworthy and of good judgment, it is good policy to let him do the fining up to a specified amount for defects which can be remedied or mended in the sewing room, but when the specified amount is not adequate to repair the defects which exceed the average, then he should call the overseer's attention to them. The overseer should then send for

the weaver and look the defects over before him, explaining their seriousness and instructing him how they should be avoided. If the weaver complains about the fine being too heavy, like a "Jew" I once had who usually asked me if "I couldn't make it a little sheaper," ask him if he can do better work; if so it will save you the unpleasant task of having to fine him so much; if not, it would pay you better to let the loom stand. Avoid humiliating any one as much as you can, especially in front of others, but still be firm in your decisions. Be fair to all and have no favorites; and bear in mind no matter how well you hold your work in hand you cannot do a man an injustice without injuring yourself.

As an overseer you will have to be everlastingly instructing your weavers in their work if you ever become eminently successful; or otherwise have a second hand capable of doing this. You have to be always on the alert in building up their efficiency. You will often have to tell them that vicious handling of a tender warp is what makes it go bad. You will often see them leaning on it with their arms when looking for an empty heddle, etc., etc. Always be on the lookout for these things and persevere in teaching them how harmful they are. Insist on neatness about their work, and have them keep the floor clean around and under their looms. If you find it necessary to

get "mad clear through" once in a while, do not be hasty of action at such times; wait until you cool off a little and be sure your head is level; try to keep it so at all times.

FILLING CARRYING

The man who has charge of the filling department has one of, if not the, most important branch of a fancy woolen or worsted weave room.

While the work itself is not difficult nor calls for any great amount of brains in its handling, it needs a man with a careful and orderly disposition. Careful to see that weavers always use up one lot before they start on another lot. This rule must be as rigidly followed in white yarn as it is in colored, and the overseer of weaving should exercise greater oversight in this case, because neglect is not apparent on the surface until the goods are colored and finished, whereas with colored yarn a change of lots may sometimes be noticeable on the loom. Where a number of looms are using the same filling, when the end of the lot is in sight, the filling carrier should scheme to change them over when the cuts are full, leaving only the last one to be changed in the middle of a cut; and this, if anywhere near the end, would be better to put the heading in there, or weave along till the filling is all used up before putting the heading in if it does not go more than 8 or 10 yards past the cut mark.

A good, orderly disposition will keep things from getting mixed up and woven into the wrong warp; will prevent pieces of bobbins from accumulating; will wind up the small pieces of spools before starting on a full one and will have a tendency to keep the weavers filling boxes orderly so that there will be no odd bobbins left over in them. Make the head filling carrier responsible for all these things and for the winding, and let him choose his own assistants if any are needed, knowing well that if you have a man or boy you wish to bring in he will surely give him preference.

Educate your filling carrier to be prompt in taking the filling away from the loom when a warp is out, and to do this thoroughly so that none of it will be left in the shuttles hanging up on the loom or in the boxes; to be impartial to the weavers in serving the filling and to use good judgment at all times.

THE PERCHER

In selecting a percher try to get a man who is easy going and care free; one who keeps good bed hours and does not spend his evenings boozing and playing poker. If he has domestic or outside business troubles or in other ways does not keep his mind clear, especially when looking over the headings, he will surely miss something he ought to catch; a wrong draw, thread out or in the wrong place, or some such defect which may go through another cut before it is discovered. A percher's business is to look the cloth over as it comes from the looms, measure and weigh it, record all particulars in the perch book or ledger or both. To see defects in the cloth when they are there and to know what such defects are when he sees them.

Always bear in mind that, however well qualified your perchers may be, their efficiency, like that of the warpstarters, weavers, loomfixers, etc., has got to be kept up.

Let up in your vigilance with your perchers and they will follow suit as quickly as any class of help in the mill.

KEEPING THE ROOM CLEAN

If your plant is big enough to warrant the expense, perhaps the best system of keeping the weave rooms and toilet rooms clean is to hire an old woman or some simple-minded person to do this work and nothing else; the place will be kept cleaner and with less care on yourself in this way than if some of your regular force has to do it as a side line. Sink rooms and waterclosets should be scrubbed out at least once a week. In small weave rooms you have, of course, to depend on some one of your regular force to do these things, and, speaking personally, I have to admit that under those circumstances I have never been able to keep a place as clean as I should have liked to. This, therefore, is one of those things which are much easier to accomplish on a large scale than on a small one. It is, however, a work which has got to be done, and the better it is kept the more respect your help in general will have for it. Let dirt accumulate in any one place and it will quickly become a dumping place for all kinds of rubbish. In order to keep a room reasonably clean it must be cleaned up often; swept, say from two to four times a day. Deep cans or boxes should be placed at reasonable distances

for the weavers and others to put their sweepings in. Fix it up with the man in charge of the waste room to go or send a man around the room once a day and pick up the regular clean waste; by so doing he will be able to keep the different kinds separate according to his own taste and instruct the weavers to do so. Much can be said on the subject of clean weave rooms, but when all is said and done it is still up to the judgment of the overseer to a great extent as to how far he shall go in this direction; such judgment being formed, of course, by the general condition of things and the attitude of the management in particular. Much depends on the circumstances under which one has to work. In a nice, new mill with good, smooth floors it is good policy to have them scrubbed regularly, but in an old mill, etc., it is a different matter. But in any case it is safe to say that neatness and cleanliness materially helps the production and improves the minds of the operatives.

BEFORE THE HIGH COURT IN
THE FINISHING ROOM

"Seconds" are goods which contain too many defects or are too defective to be sold as first class. They are made in all fancy woolen or worsted mills, more or less according to circumstances and the efficiency of those who produce them. The efficiency of the weave room help depends to a great extent on the overseer of that department. The efficiency of the overseers of a mill depends to a great extent on the superintendent. But, no matter how excellent may be your system or how vigilantly you may look after things, defects in the cloth will come along to some extent. Some of these defects, such as coarse yarn, unevenly woven cloth, harness skips, holes, shady filling and an unlimited number of other things, cannot be remedied in the cloth, or at least it is not practical to attempt to remedy them after they are made and woven in there; so that when the goods come to their final inspection in the finishing room there is sometimes enough of these defects in the cloth to make it a "second," thus entailing considerable loss in its value. At this point it is up to the superintendent to study these defects and determine what department is to blame for them, and to devise means of pre-

venting them in future as much as possible. Sometimes two or three departments are involved, as, for instance, defective yarn, coarse places, uneven or shady. The carding and spinning departments may be to blame for making them, but the weaver is to blame for letting them get by him. Of course, when these defects are plentiful and of all degrees of magnitude, it is impossible for a weaver to catch them all, so that some of them get by and the goods are seconds. Now, although these defects are or should be reported long before the goods get to the finishing room, when they do get there, whatever the defect may be that has caused a piece of goods to be made a "second," every effort must be made to prevent a recurrence; so to this end the superintendent sends for the overseer of whatever department there is a suspicion of neglect; usually, of course, the weave room. It makes little difference what defects of material the weave room has to contend with, its product must be good or there is lots of trouble.

Now the superintendent is usually a wise man; he knows a thing or two, as he has been through the ropes himself, and he doesn't always let his lectures rest with the overseer of one department, even though in his own mind he knows that that one department is the only one to blame in that particular instance. He knows that he has got to

get after the other departments once in a while to keep up their vigilance; so that when the cause of the defects are in doubt or if it can be made to appear doubtful, two or three overseers are liable to be called to account. This is usually a trying time for the overseer, because it is often something he cannot positively prevent altogether, though as a result of the interview he may decide that it would be better to concentrate his attention a little more on this particular point. An overseer's deportment at such times may be very helpful to him in inspiring confidence in his ability to handle the situation. For instance, supposing the goods are coming "rowey" for some reason or another, the cause of which is hard to determine. The superintendent, if at all in doubt, and sometimes when not in doubt at all, will send for the overseers of each department where roweness of that apparent nature can be caused, one at a time, of course, and, if not absolutely blaming each department, will leave it to be inferred that they are apparently not using sufficient vigilance in that particular direction. By so doing he not only gets the right one, but stirs up the others to renewed activity, and without a doubt this is good policy, if not carried altogether too far.

Human nature is such that if allowed to become stagnant we deteriorate in efficiency. Therefore the supposition is that even though you are not

actually making seconds at the time being, you might soon get to that stage if not stirred up occasionally. The maxim, "prevention is better than cure," applies in this case just as much as in bodily ailments. But to return to the weaving business in general and to this rowey goods business in particular. The superintendent will, after getting through with the finisher or dyer or whoever he has decided to get after for negligence, besides the boss weaver, then send for the latter and at once begin to show him that his filling carrier must have mixed the lots; or he may be more aggravating still and say that you or he (the filling carrier) are getting everything mixed up; there is the evidence of it in the goods before you; this business can't go on this way, etc. This, as has been said, may be good policy if not carried too far. If not pursued with good judgment, however, it may be a serious injustice to some of the overseers who are satisfied that their department is not only not to blame, but that they have used more than sufficient care at that particular point where they are accused of negligence.

However, to come down to your own case as overseer of the weaving department, you know that your help needs to be stirred up once in a while just as much as you do yourself, therefore why should it not be good policy for you to carry

that system into your own department by sending for your head filling carrier and showing him the result of an evident mix-up in the lots. Thus, though he might not have been to blame, though in reality there may not have been any filling lots mixed, in fact, your department may not necessarily have been at fault, it will serve to prevent a lack of vigilence in that direction and in his making sure that the weaver has used up all the old lot of filling before the new lot is given to him. It does more good to show the goods that are defective to the party who you judge to be most to blame than it does to just merely tell him about the matter. Then, again, if the trouble is something that the weaver could possibly prevent, either altogether or to a greater or less extent, such as coarse filling, shady filling, uneven starting-up places, etc., unless he (the weaver) has seen them at the weave room perch and been substantially fined for them, bring the percher down to see how the thing looks. He will thus realize more fully that a lack of diligence on his part results in carelessness on that of the weavers. But, referring to your deportment at such times, try to size up the situation deliberately and with good judgment, tell the superintendent what you think of it, keep cool and do not talk at random nor too much; and if he has not been altogether too aggravating, so much so as to make a calm, reasonable statement impossible, inform him that

you will give the matter your careful consideration and endeavor to devise means of preventing such defects as much as possible in the future. By so doing you will win his confidence and he will be more satisfied that everything possible is being done. Your work as overseer of weaving calls for eternal vigilance. I speak now of a good-sized fancy goods mill in particular. You cannot let up in your vigilance one day without noticing the results yourself. You cannot let up in it two days but what your help will notice it. You cannot let up in it three days but what the management of the mill must notice it; it will show in the goods. Do not be discouraged as long as you think you can handle the situation; remember that trials and tribulations are a part of the job.

STARTING IN AT A NEW PLACE

One cannot start in at a new place and expect to have everything well in hand the first day or to change the system over to his own ideas at the start. When you go to take charge of a weaving department that has been running under a management of different ideas to your own there is usually a system already in force; it is according to that system the force is organized, and it is in accordance with that system that you must, for the time being, work. It would be bad policy to upset a long-established system suddenly and without first getting familiar with its details. You may see one hundred things that are not right, that may be positively wrong, but if you go to work and change them over too fast you would quickly find two hundred other things out of harmony, and before a week had gone by your work would be on top of you so that you could not move. The superintendent would have to come to your assistance in order to save the situation, and, while he may approve of your push and energy, would certainly lose confidence in your judgment and tact. He may admire your heroic efforts, but would hardly feel like trusting the management to such judgment. If you find that

the adjustments of your warp beams, friction bands, take-up motions, shedding motions, box motions, harness cylinders, etc., are not to the best interest of the work in hand, or that the chain drafting is actually bad, or that the warp starter or filling carrier or percher is not the right man in the right place, go slow in making changes. Changes, of course, will have to be made or the job would soon be vacant again.

When a warp comes out let that loom be the center of your observations, both before the new warp goes in and after it is started. Whatever you see is not right about the loom call the loom-fixer to it and have him make it right. Be particular about the adjustments of the friction bands, and if you find the heavy-weight notch in use, evidently to save the trouble of piling on a few more weights, inform the fixer and warp-starter that the light-weight notch must be used when an excessive amount of weight is not called for. Explain that it is more sensitive to the pull and can therefore be depended on to let the warp off more regularly; whereas, when the heavy-weight notch is used, and the warp gets down to the last cut, it has more of a tendency to let off in jumps at irregular intervals. If you find anything the matter with the cloth at the start, call the warpstarter's attention to it and caution him to look out for such things. Take especial inter-

est in everything concerning the starting of a new warp yourself and you will quickly find the loom-fixer and every one else will take a tumble and follow suit. By following this line of action you will be gradually straightening things out to your own taste, and so surely that by the time all your looms have got a new warp you will know where you stand and that you stand on solid ground. The improvement in the production will be such that it will be noticeable without a microscope. While you are doing all this you can at the same time be getting a good hold on the other details of your work; arranging your system to suit yourself and putting the men you have on to such work as you find them most suitable for. If anyone objects to the change and fires up his job, settle up with him at once, as he has done you a favor by leaving. But do not make any more changes until his successor has the work well in hand and is worked in to your liking. In due time you will find that you have things well in hand and that you are on top of your job and able to hold it down. But, on the other hand, just as long as you keep a man on a job for which he is not temperamentally fitted, so long will you have a weak spot in your organization and an insecure position.

Keep your own counsel and do not make your plans known until they are in operation.

STIMULATING AN INTEREST IN THE PRODUCTION

The various schemes that have been devised and put forth for stimulating an interest in the production, amongst the loomfixers and weavers in some of the larger and more enterprising mills in the Eastern States, is evidence that a great amount of intelligent study has been made on the subject, and in some cases with very good results. Some of these schemes with comments on the same as they have appeared to the writer are herein given.

One large plain goods, two-loom system mill has what is known as a premium system, the operation of which is of the following nature: At the end of every month, or perhaps four weeks, each weaver's total earnings are figured up. Those having earned, say $40, are given a premium of five cents on the dollar extra. Those weavers whose earnings amount to, say $45, get ten cents on the dollar extra. These figures may not be exactly correct, but are somewhere near the mark. Thus the more skilful a weaver is and the more faithfully he sticks to his work, the more he gets paid for each yard woven. A good weaver in this mill is therefore able to do very

well, whereas a slow dope of a weaver would not earn much. The system, therefore, has a tendency not only to encourage each weaver to do his level best while he is in there, but it is an inducement especially favorable to the best class of weavers. No one wants poor weavers, anyway. In a system of this kind a lower price list is more acceptable than would be the case without it.

The same idea is carried along to the loomfixers; they are given a premium once a month, amounting to something like 16 per cent. of what their weavers make over an average of, say $42. Thus if the total earnings of a section of weavers would average $44 per weaver, the fixer would get 32 cents for each weaver or $3.52 for a section of eleven weavers, in addition to his regular pay. This rate, however, seems to me rather too acute to be satisfactory, because a little hard luck or too many poor weavers on a section would spoil the loomfixer's premium to an unreasonable extent. Ten per cent. of the aggregate amount over and above a slightly lower rate than the above mentioned figure would be more satisfactory and produce fully as good results.

Another system worth mentioning in this direction is to post a notice every week in each weave room of the number of yards taken off each section of looms, the average number of picks per

yard and the percentage of time this would figure out for each loom to have run. This, as will be seen, does not affect the loomfixer's pocketbook at all, but, nevertheless, has just as good a stimulating effect on the production, because no loomfixer likes to see his percentage of production down to the bottom of the list; while those who are fortunate enough to be at the top always take great pride in the fact.

This system, however, unless carried out with discretion and good judgment, is liable to do someone an injustice and therefore to be demoralizing. If the really good and conscientious loomfixers cannot obtain the highest percentage on account of having a poor set of weavers, the whole thing is an injustice to them. Therefore, when this system is in vogue such a condition should be carefully guarded against by the overseer. Perhaps the most common plan of stimulating the loomfixer's interest in the production of the weave room is the well-known system of paying them so much per week, usually about $16, and one per cent. of the weaver's earnings. This system, however, does not amount to much as affecting the production.

OTHER WAYS OF HELPING THE PRODUCTION

In your regular travels back and forth through the weave room, if a loom is stopped, do not pass it without seeing it; see it and make no secret of the fact. If you find that a weaver is bothered with his warp threads breaking too much, tell the loomfixer to look it up and see if he can help it some. Then, if after a reasonable time he fails to make a satisfactory improvement in it, go at it yourself. Study the problem for all you are worth and do not let up on it till you have conquered it. This is where a first-class loomfixer as an overseer proves his superiority over an overseer who is nothing more than a figurehead.

As a general rule, single woolen warp yarn will weave better with a rather light tension than if kept very tight, whereas a two-ply worsted warp usually goes better woven good and tight.

There is one thing about the adjustment of the top cylinder I have found to be particularly helpful in weaving bad warps, and that is, to set it so that when the reed is beating in the filling, with the crank at its most forward point, the harnesses going up will have ⅜ in. or ½ in. to travel. Thus, as the reed in backing away from the cloth lets up on the tension of the warp threads, the

harnesses will be just getting to their highest point, thereby taking up the tension as the lay lets go on it, thus keeping the tension on the yarn much nearer even than is liable to be the case if set even two teeth out of the way, as is usually the case when set by guesswork.

The best position to set the bottom cylinder when the top one is set as just described is to set it fully two teeth ahead of the top one. This conclusion is arrived at, not through theorizing, but through long experience, though a reason for this could very readily be given here if it was thought advisable to do so. The author will, however, willingly talk on any subject contained herein to anyone seeking further information.

There are a multitude of things that can be done to help a warp at a pinch, such as putting wet headings on top of it near the whip roll to keep it moist; raising or lowering the whip roll; putting lease rods under the threads which break the most; tying the harnesses back so that the reed cap cannot bump against them; making sure that the shuttles are all right and that they do not bump against the upper part of the shed when picked out of the shuttle box.

The eccentric gears, to be set to the best advantage for a tender warp, or, in fact, for any purpose, as far as I have been able to discover,

should be set as follows: Turn crank to top center, disconnect upright shaft, loosen up the eccentric driving gear and set it two or three teeth short of the fastest point; thus, when the crank has passed the center, just a little, the head motion will be at its fastest point. This changes the harness on the slow motion and is just right for the box motion.

If you find a loom to be stopped too much because the filling is bad, look it up yourself the first. See if the tension in all the shuttles using that same filling is the same, or if some of them have too much. Study the picking motion and see if it would be possible to make the loom run with a little less power. If any of these things are wrong for the work under consideration they are wrong for any kind of work, and it would be in order to call the loomfixer's attention to them. Educate the weaver to know when he has too much tension on the filling, as he has more chance of noticing such things than the loomfixer has. There is, however, no excuse for running a loom with two holes of power more than is needed; it causes unnecessary wear on the loom and an unnecessary strain on the filling. Be on the lookout for such things all the time, and do not hesitate to open your mouth when needed. You help your weavers as well as the economy of production by so doing.

How are the bobbins wound? Do they usually weave off without any trouble as far as the winding is concerned? Are they a good shape and size? Is there as much yarn on them as you can possibly put on, to run good? If not, then study the winder until you have made everything as good as it can be made. Such things are very encouraging to the weaver when they are all right, but most discouraging when otherwise. If a weaver has a grievance, endeavor to honestly remedy the trouble, bearing in mind that his income is stopped, as well as the production of that loom, when it is stopped.

Chain Drafting is a study; it may help the production or hinder it, according to how it is done. While due consideration must be given to the avoidance of taking too many picks in succession of one bobbin and to avoiding skip boxes, it is very seldom necessary to sacrifice its simplicity. As much consideration as possible should be given to the weaver's convenience by arranging the shuttles to run where they can be seen and to running each one in its own box as much as is practical. I have often seen, and had to fix looms for most difficult chain drafts; difficult for both the loom and the weaver because there were more skip boxes than were necessary, and the

shuttles would be sent into blind boxes when they could fully as well have been run into the top box. Then again the thing would be so complicated that the weaver could never get it all into his head.

Usually an overseer whose head is thick enough to make such drafts is also stubborn enough to refuse to consider any change in it which may be suggested by someone else. I once took charge of the weaving in a fancy worsted mill in Massachusetts and found some such chains in operation. One in particular was so complicated that there was an average of two shuttle smashes to every cut, and the weaver had been changed three times on account of it. One may imagine how that would spoil the production, but it would be difficult to imagine how much. Just as soon as I could get around to it I simplified matters by making out a chain draft for it which gave three of the shuttles a box of their own on one side and joined at two on the other side. It was much better for the weaver, much better on the loom and much better for the production. The moral, therefore, is, study out a draft for simplicity; avoid having every shuttle jumping into every box on the loom and sometimes out of it. Give them each a box of their own whenever practical; study to this end and run the fancy pick in the bottom boxes, every-

thing else being equal or nearly so. A good man at planning a box chain would draft a better chain in 15 minutes than a poor one would in 15 weeks.

There is no end of things an overseer can do to help the production.

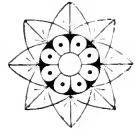
THE CLERICAL WORK

As conditions vary so much in different mills, it would hardly be advisable to advocate any definite system of filling out the warp tickets and recording the work in general. This is a work which is usually very readily systemized according to circumstances; it is probably the least of an overseer's troubles. The percher records his work in the perch book and can enter it all in the ledger at the close of each day's work. The drawers-in each have a small book of their own in which the man in charge of them puts down the style number, warp number and the number of threads of each warp as they draw them in. You, the overseer, look after the time book of the day help. If your system is such that an assistant bookkeeper is not needed in the weave room, you can go through the weave room at regular intervals, say every afternoon, and take up the warp tickets on each loom where a new warp has been put in, and enter an account of each one in the ledger and make out the piece tickets for each cut, giving each one its number as they follow along in the ledger in consecutive order.

You can enter the loom number, weaver's

name, warp number, style, number of threads, number of picks and number of cuts in the warp.

The date, yards, weight, fines, remarks, etc., will be filled in by the percher from the perch book. The irregular figuring out of amounts of material needed, summing up of your weekly production, percentage, making out the pay roll, etc., will be up to yourself to a great extent.



LOOKING OUT FOR SUPPLIES

After a good stock of supplies has been acquired it is, or should be, an easy matter to keep it up.

After the first cost, the annual expense is no greater than when running from hand to mouth. The difference in money invested between a good stock of supplies and a poor one is perhaps $70 or $80. The saving in the expense of hurried shipments, the loss of time in frequently waiting two or three days, the expense of telegraphing the orders and consequently having items in small quantities come by express would be possibly 20 times the interest of that amount. The moral, therefore, is, get a good stock of supplies and keep it up after getting it up. A good system of doing this is to have a book or sheet of paper in your desk on which to write down any item which you may find to be getting scarce. For instance, a loomfixer wants a new chain-cylinder gear; you go to get one for him and find that after giving him one you will only have one left. Make a note of this on the sheet of paper in your desk or on file, as the case may be, as follows:

WANTED

6 Chain-Cylinder Gears No. 236 or L 1029.

Then again the same way the next time you find yourself down to the last one, and so on until when it becomes imperative or even advisable to send in an order, send in the whole list which you may have been accumulating since sending in the previous order. Thus you are sure of having ordered just the things you need and no more. There is no time and labor wasted in looking things up to see what you need and in usually overlooking some important item. You get a good lot at one shipment and save the trouble and expense of frequent ordering. Keep account of everything you give out, of any consequence, and to whom you give them to. See the point?

Do you think an overseer of weaving has a snap? Well, there is one sure thing about it, he can always find plenty to do.

YARN CALCULATIONS ETC.

WORSTED—To find the number of yards of single worsted yarn in one pound, multiply the number of the yarn by 560. Thus No. 28 yarn × 560 equals 15,680 yards to the pound. If it is two-ply yarn there will be one-half that number of yards; if 3-ply, one-third, etc.

WOOLEN—To find the number of yards of woolen yarn in one pound, multiply the number of the yarn in runs by 1600. Thus 4 run yarn × 1600 equals 6,400 yards to the pound.

Twisted threads are not always of the same counts; in such cases the equivalent in a single thread is found by multiplying the two numbers and dividing the product by their sum.

For example, a 30s and a 20s twisted together:

$$\frac{30 \times 20}{30 + 20} = 12$$

Thus 1-12 would be equal to the twisted thread.

To find the woolen run, equal to a given two-ply worsted thread, divide the worsted number

twice and add up. For example, take a 2-24s worsted thread; you divide 24 twice and add up, thus:

24
12
6
—
42 Four and two-tenth runs is therefore equal to a 2-24s or a 1-12 worsted thread.

Exercises—What size woolen yarn is equal to 2-28 worsted?

Ans.: Divide 28 twice and add up, thus:

28
14
7
—
49 (4 9-10 run)

What size woolen yarn is equal to 2-40s worsted?

Divide 40 twice and add up, thus:

40
20
10
—
70 (7.0 run), etc.

This is easy when you get used to it, just as simple as A, B, C.

The same result is accomplished by multiplying the single number by 3½.

To get the equivalent in worsted counts to a given woolen number, divide the run in tenths by 3½ or multiply by 2 and divide by 7. Thus 5¼ run is equal to

$$\frac{525 \times 2}{7} = 15\ (1/15)$$

RELATIVE SIZES OF YARN

	Per pound.	Per ounce.
Woolen, 1 run.....	=1600 yards	100 yards
Worsted, No. 1 counts.....	= 560 yards	35 yards
Cotton, No. 1 counts.....	= 840 yards	52½ yards
Spun silk, No. 1 counts.....	= 840 yards	52½ yards
English skein (woolen), No. 1	= 256 yards	16 yards
Phila. cut (woolen), 1 cut....	= 300 yards	18¾ yards

TABLE OF GRAINS

437½ grains 1 ounce. 7000 grains 1 lb.

WEIGHT OF FILLING IN A YARD OF CLOTH

Take the size of the filling yarn if worsted and reduce it to its equal in woolen run.

With the run number divide the number of inches of filling in one inch of cloth, full reeded width. This gives the weight in ounces per yard. Add 7 per cent. or 8 per cent. for take up and waste.

For example, take a warp reeded 68 inches 48 pick 2-24s or 1-12s filling.

$$\frac{68 \times 48}{42} = 7.77 \text{ ounces per yard.}$$

Thus with the allowance for take up and waste about 8½ ounces would be needed.

Where do I get the 42 from? That is the equal in runs to 2-24s worsted (4.2-10 runs).

To reduce worsted numbers to their equivalent in cotton numbers, divide by 3 and multiply by 2. Thus 1-12s worsted is equal to 1-8s cotton, etc.

To reduce cotton counts to woolen run, multiply the single counts by 5¼; this will give the run and tenths. Thus 1-12s cotton × 5¼ gives 63 (6.3-10).

For finding the size of yarn by weighing 50 yards:

Grains per 50 Yds.	Worsted Counts.	Woolen Run.	Cotton Counts.	Yards Per oz.	Yards Per lb.
104.1	1/6	2 1-10	1/4	210	3360
89.3	7	2 9-20	4⅔	245	3920
78.1	8	2⅘	5⅓	280	4480
69.4	9	3 1-7	6	315	5040
62.5	10	3½	6⅔	350	5600
56.8	11	3⅞	7⅓	385	6160
52.1	12	4⅕	8	420	6720
48	13	4½	8⅔	455	7280
44.6	14	4⅞	9⅓	490	7810
41.6	15	5¼	10	525	8400
39	16	5⅝	10⅔	560	8960
36.7	17	6	11⅓	595	9520
34.7	18	6¼	12	630	10080
32.8	19	6⅝	12⅔	665	10640
31.2	20	7	13⅓	700	11200
29.7	21	7⅓	14	735	11760
28.4	22	7¾	14⅔	770	12320
27.1	23	8⅛	15⅓	805	12880
26	24	8⅜	16	840	13440
25	25	8¾	16⅔	875	14000
24	26	9⅛	17⅓	910	14560
23.1	27	9⅜	18	945	15120
22.3	28	9¾	18⅔	980	15680
21.5	29	10⅛	19⅓	1015	16240
20.8	30	10½	20	1050	16800

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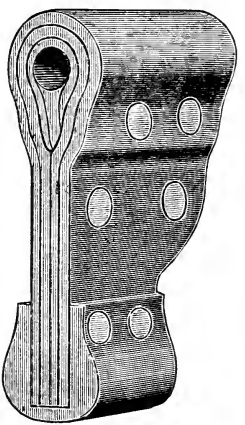

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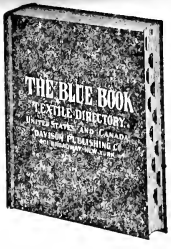

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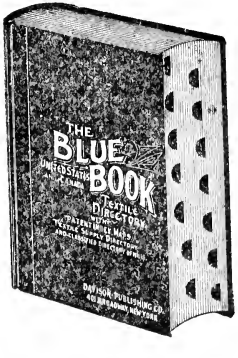

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Among Mill Officials and Overseers

The above is the title of a popular Department which appears every week in the AMERICAN WOOL AND COTTON REPORTER, and which contains weekly from *40* to *100* new personal items respecting changes and other information about mill officials and heads of departments.

These paragraphs are incidental to the work of keeping up to date our card index of the men in authority who do the buying for the textile mills of the United States. There are *30,000* of them—not mills, but men who manage the mills. THE AMERICAN WOOL AND COTTON REPORTER is somewhat jealous of this branch of its work, because there is nothing like it elsewhere in the United States, and because of the labor and experience necessary to keep in constant touch with these *30,000* buyers for the textile mills; but such insufficient statements have been recently made respecting the purchasing agencies of the textile industry, that we are now putting these *30,000* names into a directory with addresses and occupations.

The edition of this "Directory of the Men Who Make the Textile Industry" is expected to be about *35,000* copies, and while its price will be *$3.00*, it will be furnished gratis to new subscribers and advertisers of the

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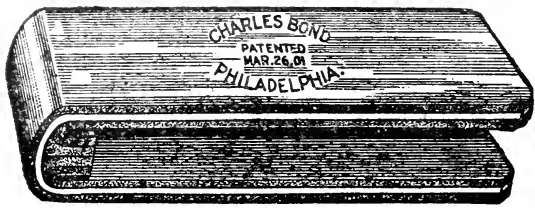

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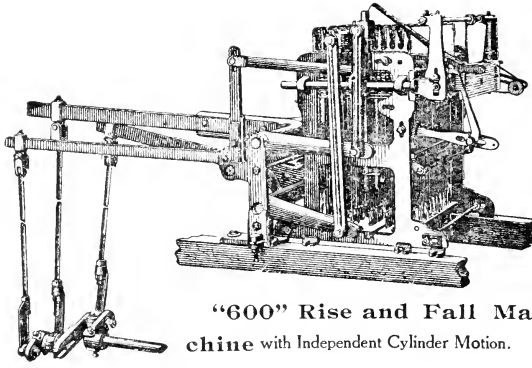

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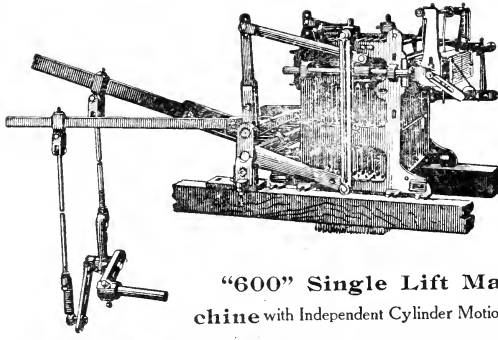

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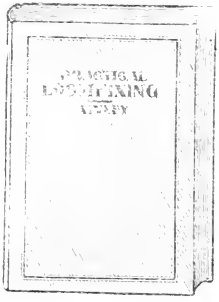

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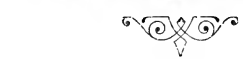

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